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SUBJECT: Determining Prices for the Milk-Fat-Protein Dollars Index

TO: Dairy Industry Cooperators

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The weights used by the Animal Improvement Programs Laboratory (AIPL) for the milk-fat-protein dollars (MFP$) index have been derived annually from the average prices of milk and components for the previous year. This procedure is market driven to the extent that individual prices of each component also are market driven. The procedure has been criticized because no additional information is used to extrapolate forward; that is, to predict the prices that will be paid when the animals that result from today's breeding decisions are producing.

Over the last decade, milk marketing has undergone rapid changes, and prices have become more volatile. The component weights used by AIPL in the MFP$ index since introducing genetic evaluations for milk components in 1977 follow:

	Weight ($/pound)			Weight ratio		
Year	Milk	Fat	Protein	Fat:Milk	Protein:Milk	Protein:Fat
1977	.034	1.48	1.17	43.3	34.2	.79
1978	.034	1.51	1.11	44.0	32.3	.73
1979	.033	1.52	1.14	45.7	34.4	.75
1980	.029	1.61	1.19	56.1	41.5	.74
1981	.028	1.63	1.20	59.0	43.6	.74
1982	.026	1.64	1.22	62.2	46.2	.74
1983	.024	1.70	1.25	71.8	52.9	.74
1984	.022	1.75	1.25	81.2	57.9	.71
1985	.024	1.72	1.20	70.9	49.3	.70
1986	.020	1.85	1.21	93.3	61.1	.65
1987	.025	1.74	1.16	69.7	46.2	.66
1988	.026	1.68	1.19	63.6	45.0	.71
1989	.027	1.46	1.41	53.9	52.1	.97
1990	.042	1.13	1.31	26.9	31.2	1.16
1991	.039	1.12	1.38	28.4	34.9	1.23
1992	.049	.79	1.45	16.1	29.6	1.84
1993	.049	.70	1.56	14.3	32.0	2.24
1994	.055	.58	1.48	10.6	26.9	2.53
1995	.047	.72	1.59	15.5	34.1	2.20
1996	.042	.89	1.55	21.1	36.8	1.74

Because genetic selection is a long term endeavor, consistency in the selection goal is desirable for maximum efficiency. Currently, MFP$ changes with the general level of milk prices, even if the relative values of carrier, fat, and protein do not change. This continual change generates unnecessary confusion in setting breeding goals for semen marketers and buyers. However, the problem can be minimized by establishing fixed weights for the 5 years between base changes.

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Considerable support has been expressed for using predictive prices and keeping them stable for longer periods. At the U.S. National Dairy Genetics Workshop in Orlando, Florida, in February 1995, endorsement for these changes was overwhelming. Official indexes of the breed associations are based on relative weights that are held stable for more than 1 year and, therefore, are not affected by price fluctuations. If the price ratios in the preceding table are multiplied by ratios of standard deviations, they can then be compared with the weights in the breed indexes:

	Relative weights of protein:fat					
Year	USDA	Holstein	Jersey	Brown Swiss	Guernsey	Ayrshire, Milking Shorthorn
1990	.9	1.0	2.0	2.0	2.0	2.0
1991	1.0	3.0	2.0	2.0	2.0	2.0
1992	1.5	3.0	4.0	2.0	2.0	2.0
1993	1.8	3.0	4.0	2.0	5.0	2.0
1994	2.0	3.0	4.0	2.0	5.0	2.0
1995	1.7	3.0	4.0	2.5	5.0	2.0
1996	1.4	3.0	4.0	2.5	5.0	2.0

Geneticists at AIPL have reviewed the historical prices and consulted with other scientists that have expressed an interest in the economic relationships. As a result of this input and based on an assumed value of $12.30/100 pounds for milk with 3.5% fat and 3.2% protein, the following weights will be used in the MFP$ index for February 1997 USDA-DHIA genetic evaluations:

$.031/pound for milk, $.80/pound for fat, and $2.00/pound for protein

where milk price = value of carrier + (value of fat × fat percentage) + (value of protein × protein percentage), which is .123 = .031 + (.8 × .035) + (2.0 × .032). This milk price will be fixed for MFP$ so that an adjustment no longer will be needed in calculating net merit dollars.

The value of carrier is highly affected by the value of the components and reflects, in part, the favorable price of milk for fluid use compared with that paid for milk for manufactured products.
Although many countries use a negative weight for carrier, the pricing situation in the United States does not currently justify such a weighting because of large fluid sales in some areas. However, a lower value for carrier is expected in the future, and a value of $.031/pound is justified because of a growing export market for semen.

The protein:fat ratio generally has increased over the last decade and is expected to increase further. Although this trend reversed for several months in mid-1996 because of a sharp increase in the price of fat, it quickly reverted to the earlier relationship. A ratio at the upper end of the range appears justified. The weights chosen result in ratios of 25.8 for fat:milk, 64.5 for protein:milk, and 2.50 for protein:fat (equivalent to 2.0 for protein:fat after multiplying by ratios of standard deviations to make the ratio comparable with breed index weights). These weights will not be changed until the next base change in February 2000. At that time, removing the cost of feed for producing the individual components would be desirable. However, at present, researchers disagree significantly on production costs.

To monitor trends in milk prices, annual prices will be recorded, and weights will be adjusted when the genetic base is updated. If the value of carrier (adjusted to a base of $12.30/100 pounds) shifts by more than $.02/pound or if the trend for protein:fat ratio appears to be drifting away from its current value by more than .5, then new weights will be considered prior to the base change in 2000.